

TABLE 2.—Free-air resultant winds (meters per second) based on pilot-balloon observations made near 7 a. m. (E. S. T.) during March, 1932—Continued

Altitude (meters) m. s. l.	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (85 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (392 meters)		Omaha, Nebr. (299 meters)		Phoenix, Ariz. (356 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface.....	321	1.8	226	0.5	331	0.7	10	0.6	78	0.8	344	1.0	351	2.3	102	1.7	100	0.6	17	0.7	182	2.3	283	2.6
500.....	7	1.5	211	0.3	257	4.0	269	1.8	340	2.0	272	0.9	323	3.3	108	0.7	356	1.0	193	5.6	193	5.6	291	8.3
1,000.....	1	2.8	151	1.1	272	6.9	252	3.4	354	4.2	285	4.6	296	8.0	317	1.5	298	2.8	207	5.9	285	12.3	285	12.3
1,500.....	358	3.3	229	2.8	282	9.6	270	6.9	329	4.2	284	5.4	299	11.1	333	3.2	204	0.8	305	5.4	191	4.9	302	15.7
2,000.....	356	4.6	275	4.5	289	10.2	293	10.1	331	5.4	287	7.2	298	13.0	311	4.0	277	3.2	308	8.0	217	3.5	291	14.9
2,500.....	341	4.7	287	7.2	305	11.9	282	13.0	328	6.3	294	9.4	300	13.5	312	5.1	290	4.3	320	9.0	250	4.1	255	8.4
3,000.....	329	4.5	296	9.2	-----	-----	278	13.4	320	7.9	236	12.1	307	17.1	304	4.3	297	6.5	320	9.8	253	4.9	286	19.3
3,500.....	298	5.8	299	10.2	-----	-----	280	19.9	310	8.5	-----	-----	-----	-----	303	9.3	306	9.2	-----	-----	-----	-----	-----	-----
4,000.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	299	9.5	-----	-----	-----	-----	-----	-----	-----	-----
5,000.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

WEATHER IN THE UNITED STATES

THE WEATHER ELEMENTS

By M. C. BENNETT

GENERAL SUMMARY

The monthly mean temperature for March was decidedly below the normal in all sections from the Rocky Mountains eastward. A number of Southern States reported the lowest March temperatures of record during the first half of the month. Freezing weather extended southward to the extreme lower Rio Grande Valley. In the interior valleys the average temperatures for the month were from 5° to 9° below the normal. On the other hand, the average for the month in the Pacific coast area was slightly above the seasonal average.

The precipitation for the month was very irregularly distributed. In most of the Atlantic area, much of Florida, the lower Mississippi and the upper Ohio Valleys, the monthly totals were above normal. In the western Ohio, central Mississippi and lower Missouri Valleys, and portions of Texas and Oklahoma they were below the normal, while the Pacific Northwest had more than normal, but the far Southwest was generally dry, while the southern portions of Arizona and California received no precipitation throughout the month. Snowfall was heavy in portions of the Northeast and much of the Lake Region, with as much as an inch occurring as far south as Palestine, Tex., and measurable amounts to Corpus Christi, Tex., and Montgomery, Ala.

For the first time in more than a year an important group of destructive local storms was reported. (See article on p. 89 of this REVIEW.)

TEMPERATURE

March was in marked contrast with the winter months which had just preceded, being colder than normal in all sections save the far West. In much of the Lake, central valley, middle Appalachian, and southeastern regions it was the coldest month of the whole cold season.

The first few days were cold in most of the far West, but quite mild nearly everywhere from the Plains eastward. By the 4th decidedly cold weather had set in over the northern and central Plains. It extended southward and more gradually eastward, the Northeastern States coming under its sway on the 7th or 8th. Generally, the period from the 6th to the 15th was the

coldest or almost the coldest 10-day period ever recorded in March in the central and southeastern portions of the country. At Huron, S. Dak., this period averaged 15° colder than normal; at San Antonio, Tex., 20° colder; at Cairo, Ill., 19° colder; and at Savannah, Ga., 15° colder. In the far Northwest this same period was mainly cold till the 13th, except close to the coast, but from the 13th onward was about normal in both coast and interior sections, while in the far Southwest temperatures were mainly above normal, particularly in California.

The second half of the month saw moderate variations of temperature in most sections, but was largely warmer than normal from the Pacific to the Plains, especially in California and Montana. In the eastern half of the country a few districts in the lower Mississippi Valley and the South Atlantic States averaged slightly warmer than normal, but mainly this period was colder than normal, particularly in the Lake region, the upper Mississippi and upper Ohio Valleys, and the interior portions of New York and New England.

March averaged somewhat warmer than normal in California, most of Nevada and western Arizona, and between the Cascade Mountains and the Pacific coast. In practically all other regions it was colder than normal and save in the Plateau region, some Atlantic States, and part of the Missouri Valley, at least 4° colder. From South Dakota, Nebraska, and Kansas eastward to Lake Michigan and the upper Ohio Valley the deficiency was usually 6° to 8° per day. In parts of the upper Mississippi Valley very few Marches have averaged colder than this one.

The highest temperature reported was 102° at two Texas stations on the 20th. In numerous States the highest marks were in the eighties, but from North Dakota to New York and New England they were generally in the sixties. Several Southeastern States noted their highest readings during the first three days, but the southern half of the country otherwise about the 20th, and the northern half largely during the final three days.

Save in the Northeast and North Dakota the lowest marks were recorded during the first 12 days. In most of the Southeast they were between zero and 25°, and came usually on the 10th, when numerous stations approached the lowest March temperatures of record. Apart from the Southeast nearly every State recorded a zero temperature, the very lowest reported being -43° at Riverside, in Yellowstone National Park, on the 11th.

PRECIPITATION

The precipitation during March was mainly well distributed in point of time. The interior of the south-central portion, however, received but little between the 6th and 20th, and in fact much of the lower Mississippi Valley got a great part of the monthly total during the last few days of the month.

As a whole, March gave much more than normal precipitation to the far Northwest, also to almost all districts from Kentucky and North Carolina northeastward. Amounts moderately above normal usually were received in central and northeastern Florida, the central part of the lower Mississippi Valley, northern Iowa and districts adjacent, and considerable portions of Wyoming and Colorado.

Nearly all of California and Arizona received far less precipitation than normal, while the middle Plateau States and western New Mexico had somewhat less. Most Gulf coast districts from western Florida westward fell far short of the normal amounts, as did almost all of the southern Plains and the central valley areas. From Michigan to central Montana there was generally a shortage, also in Nebraska and western South Dakota.

The greatest amount reported at a single station was 29.63 inches, at a place in western Washington. East of the Continental Divide the maximum was 9.79 inches at a station in the West Virginia mountains.

SNOWFALL

As a rule snowfall was greater than normal, often much greater, in the northern and middle Rocky Mountain

and Plains States, the upper Mississippi Valley, Lake region, and to eastward. Several States in the Lake region measured the largest snowfall ever known in March or very nearly the largest.

At Norfolk, Va., snow fell for the first time since March, 1931; and at Parkersburg, W. Va., the first measurable snow for over 11 months came on the 6th. There was snow enough to measure at some Texas coast stations for the first time ever known at those places in March.

The central valleys and the Ozark region usually had little snow, and there was mainly but little in the middle and southern Plateau areas.

The outlook for abundant stream flow in the Western States was usually quite good at the end of March, but in some of the southern mountain districts there was only about an average amount of stored snow or slightly less than average.

SUNSHINE AND RELATIVE HUMIDITY

Much cloudy weather prevailed in the region of the Great Lakes, the Ohio Valley and the northern half of the area west of the Rocky Mountains, while more than the usual amount of sunshine was received in the southern portion of the Plateau and Pacific areas. Elsewhere about the normal amount for March prevailed. The relative humidity was generally above the normal in much of the northern border States and also in the central portion of the Great Plains and Plateau regions, while elsewhere it was generally below the seasonal average. The departures above and below the normal were as a rule small; however, in the central portion of the South Atlantic States the deficiencies were more pronounced.

SEVERE LOCAL STORMS, MARCH, 1932

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards) ¹	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Illinois and Indiana.....	1-2				\$388, 000	Glaze.....	Telephone and electric wires and poles broken; orchard and shade trees damaged; wire communication cut off in many places.	Official, U. S. Weather Bureau.
Iowa (northern half).....	1-2					Glaze and wind.....	Many thousands of dollars damage to telephone, telegraph, and radio equipment; power and electric service crippled.	Do.
Lyon, Sioux, Clay, Dallas, Polk, Marshall, Boone, Webster, Woodbury, and Plymouth Counties, Iowa.	1-4					Floods.....	Bridges and roadbeds washed out; railways inundated; farm lands flooded.	Do.
Deepwater and Lynchburg, Tex.	3	4:15 a. m.	300			Tornado.....	Several houses and garages wrecked; 12 persons injured.	Do.
Atlantic seaboard (Florida to Sandy Hook).	5-6					Wind.....	Much damage to crops, timber, marine interests, overhead wires, and buildings.	Do.
Northern Virginia, western Maryland, and West Virginia.	6-7			2	1, 642, 800	Wind, rain, sleet, and snow.	Wire systems and buildings damaged; motor traffic tied up.	Do.
New York and northern Pennsylvania.	6-7			3		Snow and wind.....	Widespread damage to telephone and telegraph equipment; roads blocked; wire service entirely suspended in some places.	Do.
Salem (near), Ark.....	16	8:30 p. m.			1, 500	Tornado.....	Timber, barns and contents damaged.	Do.
Little Rock to Scott, Ark..	16	9:15 p. m.	100		57, 000	do.....	Damage chiefly to communication lines and buildings; path 1.5 miles long; 5 persons injured.	Do.
Crawford County, Ark.....	16-17				2, 000	Wind.....	Buildings damaged.....	Do.
Paris, Ark.....	16-17				7, 500	do.....	Chief damage to buildings.....	Do.
St. Joe, Ark.....	16-17					do.....	Frame buildings and roofs damaged.....	Do.
Walla Walla, Wash.....	18				25, 000	Heavy rains.....	Roads and bridges damaged; gardens and farm lands flooded.	Do.
New Mexico.....	20	10 a. m.			10, 000	Wind.....	Autos, roofs, sheds, trees and fields damaged.....	Do.
El Paso, Tex.....	20	5 p. m.				do.....	Considerable damage to roofs, signs, plate glass windows, and insecure objects; alfalfa injured.	Do.
Arizona.....	20-21			1		do.....	Small house unroofed; 1 person injured.	Do.
Carrier Mills to near Harrisburg, Ill.	21	3 p. m.	8-16		10, 000	Tornado.....	Buildings damaged; path 6 miles long.....	Do.
Uniontown, Ky., to Seymour, Ind.	21	3: 35-6 p. m.		2	247, 000	Wind and hail.....	Heavy property and crop damage.....	Do.
Lewis to Trusdale County, Tenn.	21	5 p. m.	250-440	3	60, 000	Tornado.....	Character of damage not reported. 16 persons injured; path 90 miles long.	Do.
Lawrence to De Kalb County, Tenn.	21	5: 30-7 p. m.	100-440	9	120, 000	do.....	Great destruction to property along 100-mile path; 73 persons homeless.	Do.
Atlanta, Ga., and vicinity..	21	6-7 p. m.		1	15, 000	Wind.....	Plate-glass windows broken; power lines damaged; light and telephone service impaired.	Do.

¹ "Mi." indicates miles instead of yards.